In The Claims:

1. (Previously Presented) A method of making an optical waveguide, comprising

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

forming an opening through said semiconductor layer to said first insulating layer;

depositing a core material on said first insulating layer to fill said opening, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material; and

depositing a top cladding layer over the core material.

2. (Previously Presented) A method according to claim 1 wherein said semiconductor layer comprises at least one material selected from the group consisting of silicon, silicon-germanium, gallium arsenide, indium gallium arsenide and indium phosphide.

3. (Previously Presented) A method according to claim 1 wherein said semiconductor layer is silicon.

4. (Previously Presented) A method according to claim 3 wherein said first insulating layer and said top cladding layer are of silicon oxide, each layer having a different refractive index.

5. (Original) A method according to claim 1 wherein excess core material is removed by chemical mechanical polishing.

6-8. (Cancelled)

9. (Previously Presented) A method according to claim 1 wherein said substrate further comprises:

a second insulating layer having the first insulating layer disposed thereon.

10. (Previously Presented) A method according to claim 9, wherein the second insulating layer and the first insulating layer are comprised of the same material.

11. (Previously Presented) A method according to claim 9, wherein the second insulating layer is comprised of glass.

12. (Previously Presented) A method according to claim 9, wherein the second insulating layer is comprised of silicon oxide.

13. (Previously Presented) A method according to claim 1, wherein the first insulating layer forms a bottom cladding layer having a refractive index different than the top cladding layer.

14. (Previously Presented) A method according to claim 13, wherein the bottom cladding layer is comprised of glass.

15. (Previously Presented) A method according to claim 9, wherein the core material forms an optical waveguide cladded by the first insulating layer and the top cladding layer.

16-20. (Cancelled)

21. (Previously Presented) A method of making an optical waveguide, comprising:

providing a substrate comprising a silicon semiconductor layer disposed on a first insulating layer;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and

depositing a top cladding layer over the core material, wherein said first insulating layer and said top cladding layer are of silicon oxide, each layer having a different refractive index.

22. (Previously Presented) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer, a first insulating layer, and a second insulating layer, the semiconductor layer disposed on the first insulating layer and the first insulating layer disposed on the second insulating layer;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and

depositing a top cladding layer over the core material, wherein the second insulating layer and the first insulating layer are comprised of the same material.

23. (Previously Presented) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer, a first insulating layer, and a second insulating layer, the semiconductor layer disposed on the first insulating layer and the first insulating layer disposed on the second insulating layer, wherein the second insulating layer is comprised of glass;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and

depositing a top cladding layer over the core material.

24. (Previously Presented) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer, a first insulating layer, and a second insulating layer, the semiconductor layer disposed on the first insulating layer and the first insulating layer disposed on the second insulating layer, wherein the second insulating layer is comprised of silicon oxide;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and

depositing a top cladding layer over the core material.

25. (Previously Presented) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer, a first insulating layer, and a second insulating layer, the semiconductor layer disposed on the first insulating layer and the first insulating layer disposed on the second insulating layer;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and

depositing a top cladding layer over the core material, wherein the core material forms an optical waveguide cladded by the first insulating layer and the top cladding layer.